Technology: Optoelectronics

Arima Optoelectronics Corp (Dashi, Taiwan) has bought an AIX 2000HT and 2400G3HT system from AIXTRON to expand its capacity for nitride-based ultra-high-brightness LEDs.

"We have more than 20 patents for several LED epi-structures on some AIXTRON Planetary Reactors," says director Andy Huang.

Uniroyal Technology Corp's subsidiary **Uniroyal Optoelectronics** LLC (Sarasota, FL, USA) is sampling high-power (60 mW), large-area 450 nm blue LED chips. It is also testing a UV large-area chip of similar power output.

As it continues to ramp up LED production across all wavelengths (including green, blue, cyan and white GaN-based LEDs), Agilent Technologies and Philips Lighting joint venture **LumiLeds Lighting** has bought multiple GaNzilla MOCVD tools from EMCORE Corp (Somerset, NJ, USA) in the initial phase of an agreement.

First laser-based data transmission between satellites

In November, the first data link was established between satellites using a laser beam as signal carrier.

The SILEX system (designed and built by Astrium) provides an optical data transmission link between ESA's Artemis communication satellite (built under the leadership of Italy's Alenia Spazio, launched in July 2001 and operated from a control station in Fucino, Italy by the Alenia Spazio/Telespazio consortium Altel - see Issue 8, page 46) and the French space agency CNES' Earth observation satellite SPOT 4 (orbiting the earth at an altitude of 832 km). The test was organised and technically supported by an ESA team at Redu, Belgium and an Astrium team at Fucino in cooperation with the CNES SPOT 4 operational team in Toulouse.

The main challenge in establishing an optical link between satellites is to point a very narrow beam with extreme accuracy to illuminate the partner spacecraft flying at a speed of 7000 m/s. The experiment was performed under worst-case conditions since Artemis is not in its nominal geostationary position but in a tempory lower parking orbit at 31 000 km, circling the Earth every 19 hours.

When in line-of-sight (for 4-20 minutes each orbit), images taken by SPOT 4 can now be transmitted in real time at 50 Mb/s via Artemis to the image processing centre at Spot Image in Toulouse, France.

The first experimental transmission of a SPOT 4 image was due in early December. From Christmas to mid-2002, the ion-propulsion phase will move Artemis to its final geostationary orbit at 36,000 km.

Coolerless 980 nm modules

Blue Sky Research (Milpitas, CA, USA) is sampling its EPM980 highly stable Coolerless 980 nm Laser Pump Module (with output powers of 50-120 mW; without cooling from 0-70°C) for production by end-Q1/2002.

Due to integration of its proprietary µLens technology at the diode level instead of the package level (in a hermetically sealed TO-can mount, packaged for direct replacement of standard butterfly devices) which "simplifies assembly, lowers production costs and greatly increases manufacturing yields", pricing of US$400 should enable entire EDFA units at under US$1,000.

High-output 40 mW cw DFB laser

14xx and 980 nm pump laser supplier **Fitel Technologies Inc** (Clinton, NJ, USA) and its parent company **The Furukawa Electric Co Ltd** (Japan) are delivering a high-output 40 mW continuous wave (CW) distributed feedback (DFB) laser module for long-distance transmission in DWDM systems - currently the highest-power CW DFB commercially available (rather than the typical 10-20 mW).

The laser helps to maintain signal strength versus optical loss when combined with a Lithium Niobate modulator and wavelength division multiplexer, resulting in an extremely low chirping characteristic that enables long-distance, high-capacity transmission.

The modules are available in a full 1500-1625nm ITU-T wavelength line-up to support large channel counts and the growing reliance on L- and S-bands.

* Fitel has also launched a series of low-cost, uncooled coaxial Distributed Feedback (up to 2.5Gb/s) and Fabry Perot (FP) laser modules which enables extremely low power consumption and small mounting size due to the absence of a thermoelectric cooler.

The suite of four DFB modules and one FP, which vary in power from 0.05-1.6mW, are available in three different package designs: MF Pigtail module, RC module, and LC module.

The M1 and M2 series of uncooled 1310, 1510 and 1550 nm DFB modules are for intermediate- and long-haul use. The 1470-1610 nm MX series is for Course Wavelength Division Multiplexing.

The 1310 nm FP module for intermediate use supports SONET/SDH and Fiber-in-the-loop (FITL) compliant links for speeds up to 622 Mb/s.

Mitsubishi's 10 Gb/s DFB

The Electronic Device Group of **Mitsubishi Electric & Electronics USA Inc** (Sunnyvale, CA, USA) has launched the ML9XX18 series of InGaAsP 10 Gb/s distributed feedback (DFB) lasers (with a high extinction ratio of 11 dB, a high side-mode suppression ratio of 40 dB, and a fast response time of 30 ps). These integrate an electro-absorption (EA) modulator to create a 1550 nm light source that is stable for short- and intermediate-reach data transmissions up to 50 km.